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THE

ONTARIO WATER RESOURCES
COMMISSION

WATER POLLUTION SURVEY
# of the
VILLAGE OF COURTRIGHT
in the
COUNTY OF LAMBTON

1967

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REPORT

ON A

WATER POLLUTION SURVEY

OF THE

VILLAGE OF COURTRIGHT

COUNTY OF LAMBTON

1967

DISTRICT ENGINEERS BRANCH

DIVISION OF SANITARY ENGINEERING

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ONTARIO WATER RESOURCES COMMISSION

REPORT

INTRODUCTION

A water pollution survey was carried out in the Village of Courtright in September 1967. Similar surveys were conducted in August 1963 and April 1959 and reports were submitted outlining conditions found at that time. This survey included the locating and sampling of local municipal surface water drain outfalls and some private drain outfalls. Samples were also collected from the St.Clair River, upstream and downstream of Courtright.

Surveys of this nature are conducted throughout the Province of Ontario by the Ontario Water Resources Commission to form a basis for evaluating any existing, or potential sources of pollution. Where these sources are noted, recommendations concering their abatement are made to the parties concerned.

Where water and water pollution control works appear desirable, or expansions to present facilities are necessary, the OWRC has a programme to aid in the construction and financing of these works.

GENERAL

The Village of Courtright, with an assessed population of 598 (1967 Municipal Directory) is situated in the County of Lambton. The municipality is located near the junction of Highways #40 and #80, on the east bank of the St.Clair River, approximately 14 miles south of the City of Sarnia.

General drainage for the area is provided by several local surface water drains. Drainage direction is towards the northwest with discharge directly to the St.Clair River.

Soil conditions in the village are not suitable for the efficient functioning of septic tank field tile disposal units. Consequently, problems are being encountered with the operation of such systems.

The Village of Courtright does not possess an official plan. Such a plan would be useful for controlling the municipality's development.

WATER SUPPLY

There is a municipal water supply system serving the Village of Courtright. It consists of two drilled wells and supplies water to approximately 300 services.

WATER POLLUTION

Sewage Treatment Facilities

The Village of Courtright does not have communal waste treatment facilities. Sanitary sewage from residential and business premises is disposed of by means of individual septic tank systems. In many cases these systems do not operate efficiently because of adverse soil conditions in the municipality and because of lot size limitations in the built up areas.

The installation of septic tank and field tile disposal systems is now strictly supervised by representatives of the Lambton

County Health Unit. However, it is noted that many of the older premises were connected to the municipal surface water drainage system or discharged directly to the St. Clair River prior to the establishment of the local health agency.

Industrial Wastes

The municipality does not have any industries producing large volumes of waste water requiring treatment.

Refuse Disposal

The Village refuse disposal site, located approximately 1/4 mile east of Courtright, is no longer utilized by the municipality. Refuse is now disposed of under private contract.

WATER QUALITY ANALYSES

As a measure in locating and assessing the level of pollution being discharged from the village, water samples were collected, where possible, from the flows of surface water drain outfalls and from private drain outfalls. Samples were also collected from the receiving stream, the St.Clair River, upstream and downstream of Courtright, to determine the effect of the drain outfalls on the water quality of the river as it flowed past the municipality.

The sanitary chemical analyses and the results of bacteriological examinations of samples collected from the river and from the drain outfalls are listed in Tables I and II respectively (appended). The locations of sampling points are plotted on the accompanying map.

INTERPRETATION AND SIGNIFICANCE OF ANALYSES RESULTS

For convenience in the interpretation of laboratory analyses results, the Ontario Water Resources Commission water quality objectives for surface water drains and watercourses are listed as follows:

Bacteriological Examination

The membrane filter (MF) technique is employed at OWRC Laboratories to obtain a direct enumeration of coliform organisms and is reported per 100 millilitres (ml) of the sample.

The presence of coliforms may indicate pollution from both faecal and non-faecal sources while E.Coli organisms indicate pollution of intestinal origin only. The maximum limit of 2,400 coliform organisms per 100 millilitres is the objective for bacteriological quality of surface water in Ontario.

Sanitary Chemical Analyses

Biochemical Oxygen Demand (BOD)

The BOD of sewage or polluted waters is the oxygen required during stabilization of the decomposible organic material by aerobic biochemical action. A five-day BOD determination with incubation at 20 degrees Centrigade is reported. A high BOD is indicative of organic or chemical pollution. A desirable upper limit in surface water is four (4) parts per million (ppm) while the objective maximum in waste discharges to a watercourse is 15 ppm.

Solids

The value for total solids expressed in parts per million (ppm) is the sum of the values for the suspended and dissolved matter in water. The concentration of suspended solids which indicates the measure of undissolved solids of organic or inorganic nature is generally the most significant of the solids analyses in regard to surface water quality. The effects of suspended solids in water are reflected in difficulties associated with water purification, deposition in streams, and injury to the habitat of fish. The OWRC's objective for discharge is a suspended solids concentration of not greater than 15 ppm.

Alkyl Benzene Sulfonate (ABS)
(Anionic Surfactant)

The surfactant is a synthetic organic chemical which is used as a principal ingredient of modern household detergents. The popular use of synthetic detergents for general cleaning purposes has resulted in the incidence of residual ABS in waste discharges. Therefore, the presence of detergents in water samples is usually an indication of pollution from domestic sources.

DISCUSSION

Surface Water Drains

At the time of the April 1959 survey, six drain outfalls were located and sampled. It was indicated that all of these drains were discharging polluting materials (sanitary sewage) to the

St.Clair River. In August 1963, only three of these drain outfalls were sampled (some of the other drain outlets were found to be covered with rocks and could not be reached to obtain samples) and in each case the presence of sanitary sewage was evident.

A water pollution survey conducted in 1967 confirmed that private and business premises in the municipality were discharging sanitary sewage to the municipal surface water drainage system which outfalls to the St.Clair River. In addition, several private drains discharging polluting wastes directly to the river were also located.

A total of nine drain outfalls (including private outfalls) were examined. Of these, only four contained flow and all indicated the presence of sanitary sewage. Specific attention is drawn to the following samples:

(i) Milton St. outfall - Sample No.4
(ii) Thompson St. outfall - Sample No.7
(iii) Private drain outfall - 50' N. of gravel loading area - Sample No.9

Highly polluted water was outfalling from these drains to the St. Clair River. BOD and suspended solids values as high as 360 ppm and 3588 ppm respectively were noted. Coliform counts ranged from approximately 9,000,000 to 110,000,000 per 100 millilitres of sample. All of the above values are greatly in excess of OWRC objectives.

St.Clair River

Upon examination of the laboratory results of the river samples collected upstream and downstream of Courtright (Table I), it was noted that the sample obtained near the southern limits of the village (Sample IA) showed a coliform count of 22,000 which is greatly in excess of the OWRC objective of 2,400 coliforms per 100 millilitres of sample. This high count could be due to the sewage outfalling from the Courtright municipal drains and is particularly significant in this case because it was learned that this section of the river is used extensively for swimming during the summer months.

SUMMARY AND CONCLUSIONS

The water pollution survey revealed that sanitary sewage was gaining access to the local municipal surface water drainage system and in turn to the St.Clair River. This is partially due to the adverse soil conditions in the village which are not suitable for the operation of septic tank and field tile systems, and partially to small lot sizes in certain areas which prohibit the construction of systems of sufficient size. Consequently, prior to the introduction of the local health unit, which now strictly supervises the installation of new septic tank systems, many of the older premises were connected to the surface water drainage system. In addition, some private systems discharge polluting materials directly to the adjacent watercourse.

Corrective action is required in order to eliminate the pollution outfalling from drains in the municipality to the St. Clair River. Since adverse soil conditions and lot size limitations would not warrant corrective measures on an individual basis, possibly the best solution would be the construction of an adequate sewage collection and treatment system. This course of action would also prove to be very beneficial in the event that the development of new residential areas in Courtright is contemplated.

It is noted that in the interim since the survey was conducted, the municipality had initiated a pollution abatement programme by having a consulting firm prepare a preliminary engineering report for a communal water and sewerage scheme. The municipality is to be commended for its positive approach to the problem and it is hoped that a sewerage system will be started as quickly as practicable.

RECOMMENDATIONS

The pollution abatement programme in the Village of Courtright should proceed as planned.

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Prepared by A. Burlachenko

A. Burlachenko, Civil Technologist,
Division of Sanitary Engineering.

TABLE I

VILLAGE OF COURTRIGHT - WATER QUALITY SURVEY

Sampling No.	Location of Sampling Points	5-Day BOD (ppm)	SOLIDS (ppm) Total	Susp.	Diss.	Anionic Detergents as ABS (ppm)	Coliform Count per 100 ml Membrane Filter
1A	St. Clair R. - South of Village	0.7	230	8	222	0.02	22,000
10A	St.Clair R. - Near N. limits of Village about 60' N. of gravel loading area.	0.6	248	14	234	0.00	6,000

TABLE II

VILLAGE OF COURTRIGHT - WATER POLLUTION SURVEY

Sampling No.	Location of Sampling Point	5-Day BOD (ppm)	SOLIDS (ppm)			Anionic Detergents as ABS (ppm)	Coliform Count per 100 ml Membrane Filter
			Total	Susp.	Diss.		
1.	Outfall at end of Hwy #80	3.6	1450	20	1430	0.0	30,000
2.	Drain-10 yds. N. of Customs office and opposite hotel		No flow at time of inspection				
3.	Drain-Between Centre St. and Milton St.		No flow at time of inspection				
4.	Milton St. outfall	360	3588	576	3012	0.1	9,200,000
5.	Main St. outfall		No flow at time of inspection				
6.	Approximately 25 yds. north of drain No.5		No flow at time of inspection				
7.	Thompson St. outfall	70	1442	166	1276	0.1	8,800,000
8.	Charlton St. outfall		No flow at time of inspection				
9.	Outfall - 50' N.of gravel loading area	80	1620	98	1522	0.1	110,000,000

APPENDIX

IMPLEMENTATION OF WATER AND SEWAGE WORKS PROGRAMS

Currently, there are three general methods which may be utilized for implementing sewage and water works programs. These are: 1) to enter into an agreement with the OWRC for the construction of the treatment and collector works with an obligation to pay the debt retirement and operating charges over the term of the agreement with the facility reverting to the municipality at the end of the term of the agreement, 2) by requesting the provision of service from a Provincially-owned project, and 3) by proceeding with the construction independently and meeting capital costs by the sale of debentures.

OWRC/MUNICIPAL PROJECTS

For the construction of water and sewage works under agreement with this Commission, the works are provided and developed under Sections 39 to 46 of the Ontario Water Resources Commission Act.

For this type of arrangement, the Commission utilizes a sinking fund and consequently the annual payments are based on a specific debt retirement period and the payments are unchanged for the period of the agreement. This type of project may be financed over a period of time up to a maximum of thirty years. The annual charges for projects constructed under this agreement are determined as follows:

1. Capital Repayment

   As noted, OWRC financing is by the sinking fund method and an annual payment of approximately 2 per cent of the capital cost is required to retire a debt over a thirty-year period.

2. Interest

On new Commission projects, interest is calculated at the current rate.

3. Reserve Fund

To provide money for repairs and replacements, Section 40 of The Ontario Water Resources Commission Act provides for the establishment of a reserve fund by the Commission. It is important to note that this fund is established in the name of the municipality and the balance consequently earns interest. It has now been established by Commission minute that the reserve fund billing for each project shall continue only until the fund reaches an amount of ten times the initial annual billing and the reserve fund billing shall be re-imposed only when the fund has been depleted to 80 per cent or less of the maximum amount.

4. Operating Costs

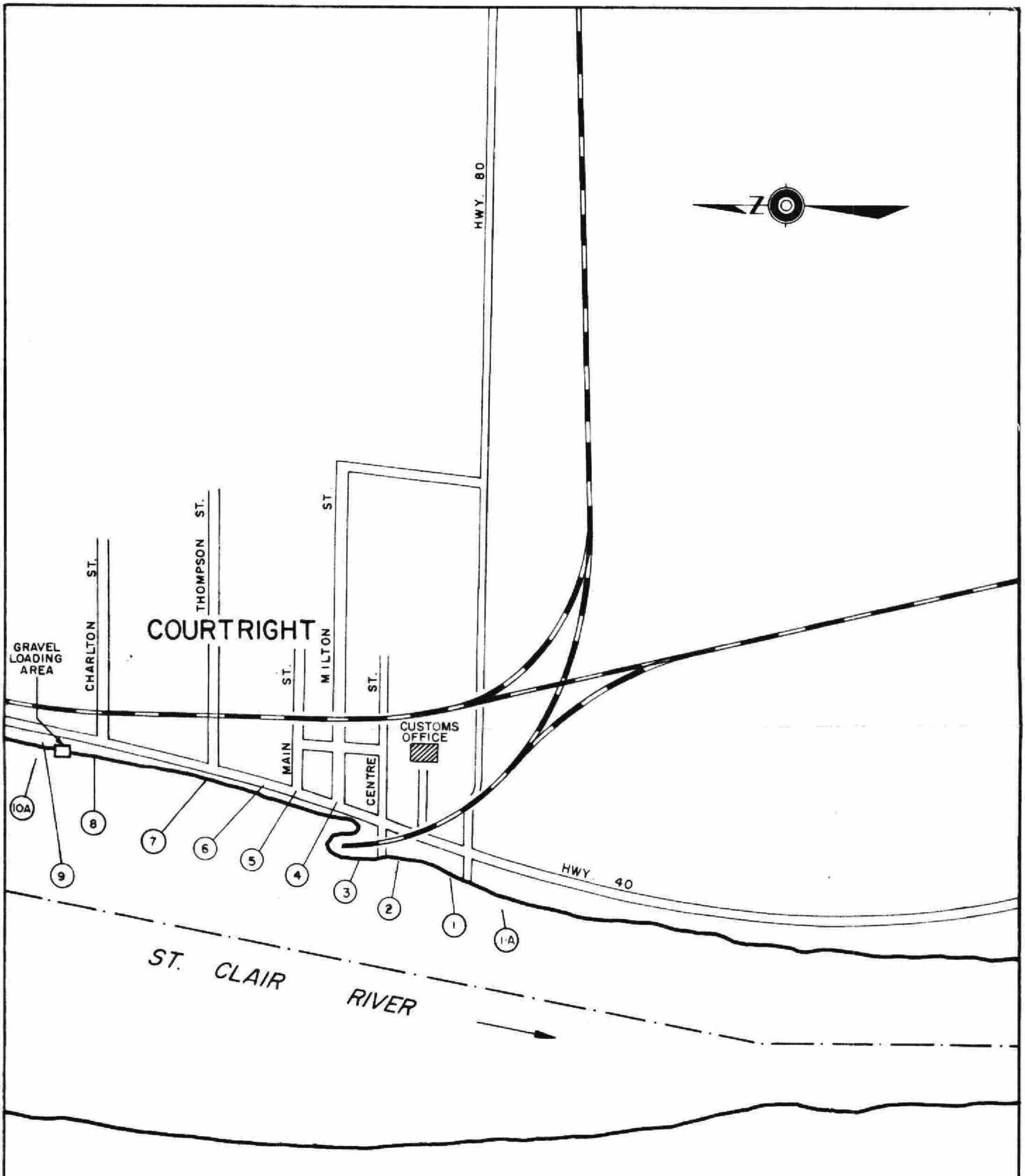
Under OWRC agreement, the municipality is responsible only for the operating costs directly attributed to the project in the municipality. Therefore, no charges are made by the Commission for the services of head office personnel who are available as required to advise on the satisfactory operation and maintenance of the project.

PROVINCIALLY-OWNED WORKS

In June, 1967, the Honourable J. R. Simonett, Minister of Energy and Resources Management, made an announcement which expanded the authorization of this Commission for the provision of water supply and sewage treatment facilities. This new program allows the Commission to construct entire water and sewage works facilities for small municipalities. The capital costs of these can be amortized over a 40 year period.

A slight variation of this program could be implemented in that the municipality may request that this Commission provide only the major water and sewage works facilities as Provincially-owned works, and develop the water distribution and sewage collector systems under the standard type of Commission project. It would appear that where applicable, it would be more advantageous for the municipality to proceed on the basis of requesting this Commission to develop entire systems as Provincially-owned works.

The associated cost of supplying these works, including amortization of capital costs, together with operating and maintenance charges, will be recovered by the sale of service to the affected municipalities by rates determined on a usage basis. These facilities will be wholly-owned by the Province of Ontario and the arrangements for service will be formalized by contracts between the Commission and the municipality concerned. The installations will be operated entirely at cost with appropriate provision for adjustment in rate.



LEGEND

⑤ - SAMPLING POINT

ONTARIO WATER RESOURCES COMMISSION

VILLAGE OF COURTRIGHT

MUNICIPAL POLLUTION SURVEY

1967

SCALE : 4" = 1 MILE

DRAWN BY : O.F.	DATE : MAR., 1968
CHECKED BY :	DRAWING NO. : 63-219

DEVELOPMENT

If a municipality, after considering the alternatives, wishes this Commission to consider Provincially-financed projects, application forms should be completed and submitted together with a resolution of the Municipal council. A draft of the suggested wording of the resolution is included with the application forms.

If the proposed works are to be built by the municipality on its own initiative or as a formal project under agreement with this Commission, it is required that the Council retain a consulting engineer to prepare preliminary engineering reports on the proposed work. If a Provincial system is contemplated, no action should be taken with respect to retaining a consulting engineering firm as the Commission will designate a consulting engineer to carry out the Provincial portion of the work and it would be advantageous if the municipal portion be studied and reported on by the same engineer.

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MOE/COU/WAT/APQY

MOE/COU/WAT/APQY + 1 map
Ontario Water Resources Co
Water pollution
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